STIC Search Report
EIC 2100

STIC Database Tracking Number: 184817

TO: Sathyanaraya Pannala **Location: RND 3A10** **Art Unit: 2164** **Tuesday, April 11, 2006** **Case Serial Number: 10/650338**	**From: Emory Damron** **Location: EIC 2100** **RND 4B19** **Phone: 571-272-3520** **Emory.Damron@uspto.gov**

Search Notes

Dear Reddy,

Please find below your fast and focused results.
References of potential pertinence have been tagged, but please review all the packets in case you like something I didn't.
Of those references which have been tagged, please note any manual highlighting which I've done within the document.
In addition to searching on Dialog, I also searched JPO/Derwent, IEEE, and Inspec.
There may be a few decent references contained herein, but I'll let you determine how useful they may be to you.
Please contact me if I can refocus or expand any aspect of this case, and please take a moment to provide any feedback (on the form provided) so EIC 2100 may better serve your needs. Good Luck!

Sincerely,
Emory Damron
Technical Information Specialist
EIC 2100, US Patent & Trademark Office
Phone: (571) 272-3520
Emory.damron@uspto.gov

```
Set     Items   Description
S1    1172366   S STORAG? OR (STORE? OR STORING?)(2N)(GROUP? OR SYSTEM? OR COMPUTER? OR
SERVER? OR DATABASE? OR ARRAY?)
S2    4087664   S FIRST? OR 1ST OR PRIMARY OR INITIAL? OR ORIGINAL? OR LEADOFF? OR MAIN OR
CHIEF OR INTRODUCTORY? OR MASTER? OR MANAGER? OR MANAGING?
S3    5246275   S SECOND? OR 2ND OR DOUBL? OR TWIN? OR EXTRA? OR ANOTHER OR SUBSIDIAR? OR
AUXILIAR? OR DIFFERENT? OR ALTERNAT? OR SLAVE?
S4    1009062   S DUPLICAT? OR SUBSIDIAR? OR PARALLEL? OR FAILSAFE? OR FAIL()SAFE? OR
SHADOW?
S5     448556   S RESERVE? OR SUPPLEMENTAL? OR SUPPLEMENTARY? OR EMERGENCY? OR SUBSTITUT?
OR SURROGAT?
S6     147231   S S1 AND S2 AND S3:S5
S7      14695   S CHECK? OR REQUEST? OR QUER? OR INTERROGAT? OR AUDIT? OR INQUIR? OR PING?
OR TRACK?
S8       7006   S SURVEY? OR SURVEILL? OR ASCERTAIN? OR ASSESS? OR MONITOR? OR QUIZ?
S9     147231   S STORE? OR STORING? OR STORAG? OR WRITE? OR WRITING? OR COPY? OR
TRANSFER? OR RECORD?
S10      8920   S BACKUP? OR BACK?()UP OR UPDAT? OR COPIE? OR DUPLICAT?
S11      9442   S DATA(2N)TRANSMI? OR REPLICAT? OR SYNCHRON? OR ASYNCHRON?
S12     32267   S CAPACITY? OR VOLUME? OR ROOM? OR THRESHOLD? OR SPACE? OR LIMIT?
S13     35654   S TIME OR TEMPORAL? OR CLOCK OR CLOCKTIME? OR CLOCKSPEED? OR CLOCKRATE?
S14     15617   S DURATION? OR SPAN? ? OR GAP? ? OR LACUNA? OR EXTENT? OR PERIOD? ? OR
INTERVAL? OR THRESHOLD?
S15     15955   S SPEED? OR PACE? ? OR TEMPO? OR SESSION?
S16     19528   S ORDER? OR SEQUENC? OR HIERARCH? OR PRIORIT? OR QUEUE? OR PECKING()ORDER?
S17      5173   S STACK? OR LIST? ? OR TAXONOM?
S18     43739   S IC=(G06F? OR G11C?)
S19     28301   S MC=(T01? OR U21?)
S20      2378   S S6 AND S3:S5(7N)S1 AND (S1 OR S3:S5)(7N)S7:S8
S21       292   S S20 AND S9:S11(7N)S12
S22        87   S S20 AND S13(7N)S14:S15
S23       258   S S20 AND S9:S11(7N)S16:S17
S24         2   S S21 AND S22 AND S23
S25        45   S S21 AND S23
S26        57   S S21 AND S22:S23
S27        17   S S22 AND (S21 OR S23)
S28        48   S S23 AND S21:S22
S29        60   S S24:S28
S30        36   S S29 AND S18:S19
S31        60   S S29:S30
S32        29   S S31 AND AC=US/PR
S33        28   S S32 AND AY=(1970:2003)/PR
S34        29   S S32 NOT AY=(2004:2006)/PR
S35        31   S S31 NOT S32
S36        27   S S35 AND PY=1970:2003
S37        25   S S35 NOT PY=2004:2006
S38        56   S S33:S34 OR S36:S37
S39        56   IDPAT (sorted in duplicate/non-duplicate order)
 ; show files
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[File 347] **JAPIO** Dec 1976-2005/Dec(Updated 060404)

[File 350] **Derwent WPIX** 1963-2006/UD,UM &UP=200624

**File 350: For more current information, include File 331 in your search. Enter HELP NEWS 331 for details.*

39/3,K/18 (Item 18 from file: 350) **Links**
Derwent WPIX

010199078 **Image available**
WPI Acc No: 1995-100332/199514
XRPX Acc No: N95-079290

Digital storage system with alternating deferred updating of mirrored storage discs - writes updated blocks to disc in write mode in pre-sorted order while guaranteed read performance is provided by other disc

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)
Inventor: DIAS D M; POLYZOIS C A; BHIDE A K; BNIDE A K
Number of Countries: 018 Number of Patents: 010
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 642081	A2	19950308	EP 94111044	A	19940715	199514	B
CA 2125201	A	19950224	CA 2125201	A	19940606	199521	
BR 9403306	A	19950620	BR 943306	A	19940822	199531	
US 5432922	A	19950711	US 93110467	A	19930823	199533	
EP 642081	A3	19950322	EP 94111044	A	19940715	199543	
CN 1102896	A	19950524	CN 94114809	A	19940725	199726	
SG 42854	A1	19971017	SG 96149	A	19940715	199751	
KR 131554	B1	19980424	KR 9418211	A	19940725	200001	
JP 3053511	B2	20000619	JP 93219992	A	19930903	200033	
CN 1096639	C	20021218	CN 94114809	A	19940725	200528	

Priority Applications (No Type Date): US 93110467 A 19930823
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 642081	A2	E	16	G06F-011/20	
Designated States (Regional): AT BE CH DE ES FR GB IT LI NL SE					
CA 2125201	A			G06F-011/08	
BR 9403306	A			G11B-005/012	
US 5432922	A		15	G06F-013/10	
EP 642081	A3			G06F-011/20	
CN 1102896	A			G06F-015/00	
SG 42854	A1			G06F-011/20	
KR 131554	B1			G06F-003/06	
JP 3053511	B2		15	G06F-012/16	Previous Publ. patent JP 7064870
CN 1096639	C			G06F-012/00	

Digital storage system with alternating deferred updating of mirrored storage discs...

...writes updated blocks to disc in write mode in pre-sorted order while guaranteed read performance is provided by other disc

...Abstract (Basic): The fault tolerant disc **storage** subsystem has a

mirrored pair of discs for storing data blocks in **duplicate** on both discs. A controller temporarily accumulates data blocks from the computer system in a memory until **storage**. The controller schedules the **stored** blocks in an **order** for efficient **writing** to the discs. The discs operate in opposite phase such that when one is in...

...Data is written from the memory onto the **first** disc during a **first** period and then copied onto the **second** disc from the **first** during a **second** period. A **requested** data block is read from either the memory or one of the discs. The data...

...Abstract (Equivalent): system uses a mirrored pair of disks (300) for storing digital data blocks (221) in **duplicate**. A disk controller (200) has a memory (220) and includes a device for temporarily accumulating a number of data blocks provided as separate writes before **storage** in **duplicate**. Each block stored on only one disk is identified and the accumulated data blocks sorted into an **order** for efficient **write** onto disks in various batch runs. A **first** mode of operation uses one disk in write-only mode and the sorted accumulated data...

...mode and write commands from the computer system (100) are received into the memory. The **second** mode of operation uses one disk in write-only mode and the other in read-only mode. The system operates in the **first** mode during spaced **time intervals** and in the **second** during at least a portion of the **time** between the spaced **time intervals**. A requested data block is provided to the computer system from the memory if it...

...tolerant. High performance for random disk I/O. Increased throughput without degradation in read response **time**. Guaranteed performance during fast recovery **period**.

(

...Title Terms: **STORAGE**;

International Patent Class (Main): **G06F-003/06**...

...**G06F-011/08**...

...**G06F-011/20**...

...**G06F-012/00**...

...**G06F-012/16**...

...**G06F-013/10**...

...**G06F-015/00**

International Patent Class (Additional): **G06F-011/16**...

...**G06F-012/06**

Manual Codes (EPI/S-X): **T01-G05**...

...**T01-H01B1**

39/3,K/24 (Item 24 from file: 350) **Links**
Derwent WPIX

009657641 **Image available**
WPI Acc No: 1993-351193/**199344**
XRPX Acc No: N93-270970

Data transfer control system for virtual machine - has memory for data transfer priorities of each virtual machine, queuing device for requests between main and external storage, transfer length limiter, request generator, and remaining transfer length calculator

Patent Assignee: FUJITSU LTD (FUIT)
Inventor: SAITO M
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5257386	A	19931026	US 91679853	A	19910403	199344	B

Priority Applications (No Type Date): JP 9090590 A 19900405
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5257386	A		15	G06F-009/30	

... **has memory for data transfer priorities of each virtual machine, queuing device for requests between main and external storage, transfer length limiter, request generator, and remaining transfer length calculator**

...Abstract (Basic): The data transfer control system includes a **storage** device for **storing** at least **transfer priorities** of each of the virtual machines. A queuing device makes a **queue** of data transfer **requests** which **request** data transfers between the **main storage** and the external **storage** and are received from operating systems which operate on each of the virtual machines. A **limiting** device is coupled to the **storage** and queuing devices for **limiting** a **transfer** data length of one data **transfer** which is requested by each data **transfer** request in the **queue** of the queuing device depending on the **transfer priority** of the virtual machine from which the data transfer request is received, so that a data transfer is made in divisions if the requested **transfer** data length exceeds a length limit determined by the **transfer priority**.

...

...A generating device coupled to the **limiting** device produces a **first** data **transfer** request in place of each operating

system with the **transfer** data length determined by the **limiting** device so as to start a **first** data transfer between the **main storage** and the external **storage.** A calculator is coupled to the generator for calculating a data length of a remaining transfer data which remains to be transferred when the **first** data transfer is completed and for automatically generating a **second** data transfer **request requesting** transfer of the remaining transfer data. The **second** data **transfer request** is inserted in the **queue** of the queuing device so that the remaining transfer data is transferred between the **main storage** and the external **storage** in one or a number of **second** data transfers

...Title Terms: **MAIN;**

International Patent Class (Main): **G06F-009/30**

Manual Codes (EPI/S-X): **T01-F05**...

...**T01-H07C**

39/3,K/33 (Item 33 from file: 350) **Links**
Derwent WPIX

007984972 **Image available**
WPI Acc No: 1989-250084/198935
XRPX Acc No: N89-190632

Store queue for tightly coupled multiple processor configuration - has several write buffers for storing instructions and data from second level store queue prior to storage in second level of cache

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC); IBM CORP (IBMC)
Inventor: GREGOR S L; LEE G S
Number of Countries: 007 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 329942	A	19890830	EP 89100716	A	19890117	198935	B
BR 8900552	A	19891017				198947	
US 5023776	A	19910611	US 88159016	A	19880222	199126	
CA 1315896	C	19930406	CA 588790	A	19890120	199319	
EP 329942	B1	19950426	EP 89100716	A	19890117	199521	
DE 68922326	E	19950601	DE 622326	A	19890117	199527	
			EP 89100716	A	19890117		

Priority Applications (No Type Date): US 88159016 A 19880222
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 329942	A	E	85		
Designated States (Regional): DE FR GB IT					
EP 329942	B1	E	89	G06F-012/08	
Designated States (Regional): DE FR GB IT					
DE 68922326	E			G06F-012/08	Based on patent EP 329942
CA 1315896	C			G06F-012/08	

Store queue for tightly coupled multiple processor configuration...

...**has several write buffers for storing instructions and data from second level store queue prior to storage in second level of cache**

...Abstract (Basic): The multiprocessor system includes a **system** of **store queues** and **write** buffers in a **hierarchical first** level and **second** level memory system including a **first** level **store queue** (18B1) for **storing** instructions and/or data from a processor (20B) of the multiprocessor system prior to **storage** in a **first** level of cache (18B). A **second** level **store queue** (26A2) **stores** the instructions and/or data from the **first**

level **store queue** (18B1) and several **write** buffers (26A2(A); 26A2(B)) for storing the instructions and/or data from the **second** level **store queue** prior to **storage** in a **secondd** level of cache. The multiprocessor system includes **hierarchical** levels of caches and **write** buffers. When **stored** in the **second** level write buffers, access to the shared **second** level cache is **requested**; and, when access is granted, the data and/or instructionss is moved from the **second** level write buffers to the shared **second** level cache...

...When stored in the shared **second** level cache, corresponding obsolete entries in the **first** level of cache are invalidated before any other processor 'sees' the obsolete data and the new data and/or instructions are over-written in the **first** level of cache ...

...Abstract (Equivalent): A multiprocessor system having a plurality of processors including a **first** processor and at least one **second** processor, a **first** level cache connected to each processor, a single **second** level cache (26B) connected to each **first** level cache (18A, B, C) and shared by the processors, and a third level **main** memory connected to the **second** level cache, a system for queuing and buffering data nd/or instructions, comprising: a **first** level **store queue** means (18B1) associated with each processor and having an input connected to its corresponding processor and connected to an input of its corresponding **first** level cache (18B) for receiving said data and/or instructions from said its corresponding processor intended for potential **storage** in said its corresponding **first** level cache and for queuing said data and/or instructions therein, each of the **first** level **store queue** means having outputs; and a **second** level **store queue** means (26A2) associated with each **first** level **store queue** means and interconnected between the output of its respective **first** level **store queue** means and an input of the single **second** level cache for receiving said data and/or instructions from said **first** level **store queue** means and for queuing said data and/or instructions therein prior to **storage** of said data and/or instructions in said **second** level cache...

...Abstract (Equivalent): A multiprocessor system includes a **system** of **store queues** and **write** buffers in two **hierarchical** level memory systems including a **first** level **store queue** for **storing** instructions and/or data from a processor of the multiprocessor system prior to **storage** in a **first** level of cache, a **second** level **store queue** for **storing** the instructions and/or data from the **first** level **store queue** and a number of **write** buffers for **storing** the instructions and/or data from the **second** level **store queue** prior to **storage** in a **second** level of cache. The multiprocessor system includes hierarch hierarchical levels of caches, including a **first** level of cache associated with each processor, a single

shared **second** level of cache shared by all the processors, and a third level of **main** memory connected to the shared **second** level cache...

...A **first** level **store queue**, associated with each processor, receives the data and/or instructions from its processor and stores the data and/or instructions in the **first** level of cache. A **second** level **store queue**, associated with each processor, receives the data and/or instructions from its **first** level **store queue** and temporarily **stores** the information therein. For sequential stores, the data and/or instructions are stored in corresponding **second** level write buffers. For non-sequential stores, the data and/or instructions bypass the corresponding **second** level write buffers and are stored directly in a final L2 cache write buffer. When stored in the **second** level writer buffers, access to the shared **second** level cache is **requested**.

...

...ADVANTAGE - Has increased **capacity** of **store queues**.

(77pp)

Title Terms: **STORAGE;**

International Patent Class (Main): **G06F-012/08**

International Patent Class (Additional): **G06F-009/00**...

...**G06F-013/20**...

...**G06F-015/16**

Manual Codes (EPI/S-X): **T01-H02**...

...**T01-J02**

39/3,K/3 (Item 3 from file: 350) **Links**
Derwent WPIX

014383502 **Image available**
WPI Acc No: 2002-204205/200226
XRPX Acc No: N02-155253
Clustered computer system used for on-line transaction processing and decision support, blocks processing of write requests if write queue exceeds threshold and resumes processing if write queue is cleared below specific level
Patent Assignee: NCR CORP (NATC)
Inventor: MCDOWELL S R
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 6260125	B1	20010710	US 98207935	A	19981209	200226	B

Priority Applications (No Type Date): US 98207935 A 19981209
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6260125	B1		10	G06F-012/00	

Clustered computer system used for on-line transaction processing and decision support, blocks processing of write requests if write queue exceeds threshold and resumes processing if write queue is cleared below specific level

Abstract (Basic):
... A **write** queue receives write **requests** directed to disk **storages** in **primary** and **secondary** servers, where the **secondary** server receives the **requests** with specific delay. Processing of further write **requests** to disk **storage** in **primary** server and **write queue** is blocked, if **write queue** is beyond a **threshold**. If **write queue** is cleared below a lower level, processing of write request is resumed.
... For asynchronous disk mirroring in fault-tolerant data **storage** system used in client-server network e.g. LAN for on-line transaction processing and...

...Performs log-based reconstruction of mirror drive, and ability to check point source and target **volumes** within disk mirroring application is increased. The **asynchronous** updating of mirrored devices improves performance...
International Patent Class (Main): **G06F-012/00**
Manual Codes (EPI/S-X): **T01-C01A**...

...T01-G05...

...T01-H01B1...

...T01-H05B1...

...T01-H07B...

...T01-H07C1...

...T01-H07C5E...

...T01-H07C5S

39/3,K/5 (Item 5 from file: 350) **Links**
Derwent WPIX

013965831 **Image available**
WPI Acc No: 2001-450045/200148
XRPX Acc No: N01-333077

Adaptive allocation method for storage space in data storage subsystem involves increasing and recording storage size estimate if second amount of storage space exceeds first amount of storage space

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)
Inventor: CANNON D M; MARTIN H N
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 6230247	B1	20010508	US 97960570	A	19971029	200148	B

Priority Applications (No Type Date): US 97960570 A 19971029
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6230247	B1		11	G06F-012/02	

Adaptive allocation method for storage space in data storage subsystem involves increasing and recording storage size estimate if second amount of storage space exceeds first amount of storage space

Abstract (Basic):

... **First** and **second** amounts of **storage space** are compared. A **storage** size estimate is decreased and **recorded** if the first amount of **storage space** exceeds the second amount of **storage space**. The **storage** size estimate is increased and **recorded** if the **second** amount of **storage space** exceeds the **first** amount of **storage space**.

... A **first** amount of **storage space** is allocated in a data **storage** subsystem. A **first** data item, stored in the data **storage** subsystem, occupies a **second** amount of **storage space**. INDEPENDENT CLAIMS are also included for the following...

...b) a data **storage** subsystem...

...For adaptive allocation of **storage space** in data **storage** subsystem connected to client station...
...Enables server or other data **storage** subsystem to efficiently

track target value despite any variations. Avoids the problems associated with the misallocation of **storage space**.

...

...The figure shows the flowchart of the operational **sequence** for adaptive **storage space** allocation

...Title Terms: **STORAGE;**

International Patent Class (Main): **G06F-012/02**

Manual Codes (EPI/S-X): **T01-E01C**...

...**T01-F05E**...

...**T01-H01**...

...**T01-H07C5S**...

...**T01-S03**

39/3,K/14 (Item 14 from file: 350) **Links**
Derwent WPIX

010876113 **Image available**
WPI Acc No: 1996-373064/199638
XRPX Acc No: N96-313888

Fault tolerant computer system allowing consistent database recovery - distributes audit trail files containing audit records across arbitrary number of disk volumes, after one file is full directs records towards next file stored on different disk volume

Patent Assignee: TANDEM COMPUTERS INC (TAND)
Inventor: CARLEY W J; LYON J M; MCCLINE M C; SKARPELOS M J; VAN DER LINDEN R; LYON J A
Number of Countries: 008 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 727743	A1	19960821	EP 96300260	A	19960115	199638	B
CA 2167784	A	19960724	CA 2167784	A	19960122	199645	
US 5590274	A	19961231	US 95377075	A	19950123	199707	
JP 9204340	A	19970805	JP 968775	A	19960123	199741	N
US 5764879	A	19980609	US 95377075	A	19950123	199830	
			US 96688629	A	19960729		
US 6041420	A	20000321	US 95377075	A	19950123	200021	
			US 96688629	A	19960729		
			US 9834199	A	19980303		

Priority Applications (No Type Date): US 95377075 A 19950123; JP 968775 A 19960123; US 96688629 A 19960729; US 9834199 A 19980303
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 727743	A1	E	22	G06F-011/14	
Designated States (Regional): DE FR GB IT SE					
US 6041420	A			G06F-011/34	CIP of application US 95377075
					Cont of application US 96688629
					CIP of patent US 5590274
					Cont of patent US 5764879
US 5590274	A		18	G06F-011/34	
JP 9204340	A		25	G06F-012/00	
US 5764879	A			G06F-011/34	Cont of application US 95377075
					Cont of patent US 5590274
CA 2167784	A			G06F-011/08	

... **distributes audit trail files containing audit records across arbitrary number of disk volumes, after one file is full directs records towards next file stored on different disk volume**

...Abstract (Basic): The computer system (100) distributes audit trail

files containing audit **records** across an arbitrary number of disk **volumes** (118, 120 and 122). When one trail file becomes full, audit records are directed towards a next **audit** trail file **stored** on a **different** disk **volume. Storage** (124) of newly generated **audit** rotates through the disk volumes in round robin fashion...

...Full audit trail files are eventually archived and their **space** is made available for renaming and **storage** of newly generated **audit** records. The number of audit records available for on-line recovery after a failure is not **limited** to the **storage** **capacity** of any single disk **volume**. There is no allowance for disk access between archiving of full **audit** trail files and **storage** of newly generated **audit** records...

...ADVANTAGE - Permits disk **volumes** to be designated as overflow **audit** trail **storage** to be used in extreme circumstances, such as when operator is not available to mount tape for audit dump or there is sudden burst of audit generation causing **primary** audit trail to fill before oldest file is eligible for rename...

...Abstract (Equivalent): In a fault tolerant computing system having an **audit** generator, and a plurality of **audit** trail **storage** processes, wherein said **audit** trail **storage** processes are for storing **audit** records generated by said audit generator in **audit** files accessible to said **audit storage** processes, wherein as successive **audit** files become full, current responsibility for storing audit records generated by said audit generator is transferred by sending a message from a previously responsible **audit** trail **storage** process to a newly responsible **audit** trail **storage** process, wherein successively used **audit** files are assigned unique sequence numbers in **order**, and wherein each **audit** trail **storage** process **stores** a **sequence** number identifying a last known audit file employed by one of said **audit** trail **storage** processes for storing **audit** records, a fault tolerant method for processing messages received at a **first audit** trail **storage** process, wherein said **first audit** trail **storage** process operates as if it were already the responsible **audit** trail **storage** process, said method comprising the steps of...

...a) receiving, at said **first audit** trail **storage** process, a message from a **second audit** trail **storage** process, said message including an **audit** file **sequence** number of a next audit file for receiving audit records ...

...b) **extracting**, at said **first audit** trail **storage** process, said **audit** file **sequence** number from said message...

...c) comparing said received audit file sequence number to the last known

audit file **sequence** number **stored** in said **first**
audit trail **storage** process; and...

...d) upon a determination in said c) step that said received audit file **sequence** number is greater than the **stored** last known audit file **sequence** number, 1) closing the audit file identified by the audit file **sequence** number stored by the audit file **sequence** number **stored** within said **first audit storage** process and 2) opening a new **audit** file identified by said sequence number included within said message for receiving **audit** records from said **first audit** trail **storage** process...

...Title Terms: **STORAGE;**

International Patent Class (Main): **G06F-011/08**...

...**G06F-011/14**...

...**G06F-011/34**...

...**G06F-012/00**

International Patent Class (Additional): **G06F-017/30**

Manual Codes (EPI/S-X): **T01-G03**...

...**T01-G05**

39/3,K/9 (Item 9 from file: 350) **Links**
Derwent WPIX

012374221 **Image available**
WPI Acc No: 1999-180328/199915
XRPX Acc No: N99-132481
Volume-to-volume copy method on DASD storage subsystem
Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)
Inventor: BLOUNT L C; MICHOD C S
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5875479	A	19990223	US 97779577	A	19970107	199915	B

Priority Applications (No Type Date): US 97779577 A 19970107
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5875479	A		10	G06F-012/16	

Volume-to-volume copy method on DASD storage subsystem
Abstract (Basic):
... Each data set or descriptor is **copied** from **first volume** to **second volume** in **list** structure having a **copy** status set to the **first** value in the defined **copy order**, and setting the **copy** status of each data set or descriptor **copied** to **second volume**.
... A **list** structure defining **copy** status and **copy order** of one or more data sets or descriptors is defined in a **first volume**. A **first copy** status value is setup in the **list** structure to selected data sets or descriptors in the **first volume**. The **copy** status in the **list** structure is reset or descriptors in the **primary volume updated** during pending of **copying** work, and already **copied** to the **second volume** and repeating the **copying** work atleast once. INDEPENDENT CLAIMS are included for the following...

...a) a system having several failure independent **tracked** cyclic **storage** devices...

...For backup copy and recovery of data in disk **storage** subsystem, and also for tuning **backup copy** during **volume** duplexing or mirroring concurrent with host **updating**.
...

...Reduces elapsed time of establish since there are three fewer **secondary** inputs-outputs. Obtains better host input, since read is only delayed by the write to the **primary**.

...

...The figure shows flow chart of control at **storage** control unit level for **volume** level **duplication**.

...Title Terms: **STORAGE;**
International Patent Class (Main): **G06F-012/16**
Manual Codes (EPI/S-X): **T01-C01A**...

...**T01-G03**...

...**T01-H01C4**

39/3,K/1 (Item 1 from file: 350) **Links**
Derwent WPIX

the APPLICANT

015344372 **Image available**
WPI Acc No: 2003-405310/**200339**
Related WPI Acc No: 1997-352990; 1998-314675; 1999-169377; 1999-359792; 2002-443514; 2002-727240; 2003-095136; 2003-610180; 2004-346678; 2004-374326; 2005-131470; 2005-416784
XRPX Acc No: N03-323244

Remote copy control method for large area storage system transmits data synchronously and asynchronously between sub-systems and provides a function for monitoring and managing the state of data updating

Patent Assignee: HITACHI LTD (HITA)
Inventor: HIGAKI S; NAKAMURA K; NAKANO T; OGATA M; OKAMI Y; ABEI H; KISHIRO S; YAMAMOTO A
Number of Countries: 028 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
EP 1283469	A2	20030212	EP 20025040	A	20020306	200339 B
JP 2003122509	A	20030425	JP 200219971	A	20020129	200339
US 20030051111	A1	20030313	US 200296375	A	20020308	200339
US 20050120092	A1	20050602	US 98149666	A	19980909	200537
			US 200296375	A	20020308	
			US 2002139248	A	20020507	
			US 2004912765	A	20040804	

Priority Applications (No Type Date): JP 200219971 A 20020129; JP 2001240072 A 20010808
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 1283469	A2	E	50	G06F-011/20	
	Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR				
JP 2003122509	A		34	G06F-003/06	
US 20030051111	A1			G06F-012/16	
US 20050120092	A1			G06F-015/16	Cont of application US 98149666 CIP of application US 200296375 CIP of application US 2002139248 Cont of patent US 6408370 CIP of patent US 6615332

Remote copy control method for large area storage system transmits data synchronously and asynchronously between sub-systems and provides a function for monitoring and managing the state of data updating

Abstract (Basic):
... Management information is exchanged by **storage** sub-systems that do not perform data transfer functions and the data

update state is **monitored** and controlled by each **storage** sub-system. During re-synchronization following a disaster, only the **differential** between data stored in the **storage** sub-systems transmitted immediately before the disaster is transmitted.

... 1. A **storage** sub-system...

...2. A large area data **storage** system...

...The pair of logical **volumes** for **asynchronous** remote **copying** can be generated immediately, and operation of the network can be quickly resumed after a disaster. As a redundant logical volume is not required in **order** to perform remote **copying**, memory resources in a **storage** sub-system can be used more efficiently...

...Drawing is a block diagram of the **storage** system...

...Title Terms: **STORAGE;**

International Patent Class (Main): **G06F-003/06**...

...**G06F-011/20**...

...**G06F-012/16**...

...**G06F-015/16**

International Patent Class (Additional): **G06F-012/00**

Manual Codes (EPI/S-X): **T01-F05E**...

...**T01-G03**...

...**T01-H01B1A**...

...**T01-H01C3**...

...**T01-N01D**...

...**T01-N02B2**

39/3,K/45 (Item 45 from file: 350) **Links**
Derwent WPIX

THE APPLICANT

004092876
WPI Acc No: 1984-238417/**198439**
XRPX Acc No: N84-178414
Address allocation in computer system - CPU allocated independent address spaces for access to main and expansion stores
Patent Assignee: HITACHI LTD (HITA)
Inventor: GOTO H; WADA H
Number of Countries: 003 Number of Patents: 005
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 3338329	A	19840920	DE 3338329	A	19831021	198439	B
GB 2136993	A	19840926	GB 8327930	A	19831019	198439	
GB 2136993	B	19870121				198703	
US 4639862	A	19870127	US 83544136	A	19831021	198706	
DE 3338329	C	19891019				198942	

Priority Applications (No Type Date): JP 8340676 A 19830314
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
DE 3338329	A		24		

...**CPU allocated independent address spaces for access to main and expansion stores**

...Abstract (Basic): A computer comprising a central processor unit (CPU), a **main storage** (MS), a **storage** control unit (SCU) for controlling to read from or to write in said MS in response to an instruction issued from said CPU, and an extendes **storage** (ES) connected with the said CPU and said SCU, wherein address **space** specified by said CPU for reading or **writing storage** data from or into said ES is made independent of an address space of said...

...The system comprises a CPU (11), a **main** store (31), a store control unit (21) and an expansion store (61) which is connected to the CPU and the **main** store. The CPU has an instruction controller which decodes an instruction and sends information to...

...The expansion store has an intermediate **storage** facility and a control device which **monitors** the contents of the intermediate store and starts the read/write operation. The **storage** control unit has an access **priority** decision device and a **second** intermediate **storage** facility which **stores** information selected by the access **priority** decision device. Data exchange between **main store** and expansion store is controlled by

the CPU through its instruction control which sends information...

...Abstract (Equivalent): A computer comprising a central processor unit (CPU), a **main storage** (MS), a **storage** control unit (SCU) for controlling to read from or to write in said MS in response to an instruction issued from said CPU, and an extendes **storage** (ES) connected with the said CPU and said SCU, wherein address **space** specified by said CPU for reading or **writing** **storage** data from or into said ES is made independent of an address space of said...

...Abstract (Equivalent): The computer system comprises a central processing unit, a **main storage**, and a **storage** control unit for controlling read-out from and writing into the **main storage**. This is in response to an instruction issued from the centralprocessing unit. An extended **storage** is connected to the central processing unit and the **storage** control unit. The extended **storage** includes an address **space** which is independent of the address **space** of the **main** **storage**.

...

...The central processing unit includes an instruction control for providing the extended **storage** with an instruction of transferring data between the **main storage** and the extended **storage**. The instruction having an instruction code and an operand address consisting of a **main storage** address and an extended **storage** address

...Title Terms: **MAIN**;

International Patent Class (Additional): **G06F-009/30**...

...**G06F-012/08**...

...**G06F-013/06**

Manual Codes (EPI/S-X): **T01-F02**...

...**T01-F03**...

...**T01-H01**

39/3,K/16 (Item 16 from file: 350) **Links**
Derwent WPIX

010632008 **Image available**
WPI Acc No: 1996-128961/199613
XRPX Acc No: N96-108515

Fault tolerant data storage system with hierarchy of optical, magnetic, semiconductor disks - switches storage of data from optical disk to alternate storage media e.g. magnetic disk when environmental conditions do not permit successful operation and updates optical disk with data in magnetic disk

Patent Assignee: UNISYS CORP (BURS)
Inventor: AMUNDSON D L
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5493676	A	19960220	US 9384881	A	19930629	199613	B
			US 95385601	A	19950206		

Priority Applications (No Type Date): US 9384881 A 19930629; US 95385601 A 19950206
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5493676	A		19	G06F-012/16	Cont of application US 9384881

Fault tolerant data storage system with hierarchy of optical, magnetic, semiconductor disks...

...switches storage of data from optical disk to alternate storage media e.g. magnetic disk when environmental conditions do not permit successful operation and updates...

...Abstract (Basic): an input device to receive the data to be recorded in real-time and a **main storage** device of a **primary** class of the **storage hierarchy**. The **main storage** device has a **first** set of operational characteristics including a **first** level of fault tolerances for storing received data. The **main storage** device includes fault detection apparatus providing a fault signal when a predetermined environmental condition exceeds one of the **first** level of fault tolerances, thereby preventing storing the received data in the **main storage** device. One **first alternate storage** device of a **secondary** class of the **storage** hierarchy has a **second** set of operational characteristics including a **second** level, which is higher than the **first** level of fault tolerances...

...A **storage** controller coupled to the input device receives **requests** and store the received data. The controller coupled to the **main storage** device directs the recording of the received data on the **main storage** device and to receive the fault signal. The controller is also coupled to the one **first alternate storage** device to redirect the recording of the received data on the **first alternate storage** device only when the fault signal is provided by the **main storage** device, such that none of the received data is lost...

...ADVANTAGE - **Monitoring** of environmental conditions is performed by **storage** media systems, not by environmental sensors external to system...

...The **first alternate storage** device of a **secondary** class of the **storage** hierarchy and having a **second** set of operational characteristics including a **second** level of fault tolerances, the **second** level of fault tolerances being higher than the **first** level of fault tolerances, Provides cost effective data **recording** system. Has **hierarchy** of multiple classes of **storage** devices for **recording** data without any data loss due to faults resulting from operating in severe environmental conditions. Does not require establishment of predetermined error **threshold** levels in **storage** media. Uses number of mass **storage** media capable of being selected for use in response to sensed environmental condition. Operates effectively...

...Title Terms: **STORAGE;**

International Patent Class (Main): **G06F-012/16**

Manual Codes (EPI/S-X): **T01-H01C4**

39/3,K/17 (Item 17 from file: 350) **Links**
Derwent WPIX

010410292 **Image available**
WPI Acc No: 1995-311641/199540
Related WPI Acc No: 1999-166975
XRPX Acc No: N95-235328

Data storage management for network interconnected processors - has file servers to store data files with secondary storage for files migrated from servers and storage server to manage data file transfer

Patent Assignee: KODAK LTD (EAST); AVAIL SYSTEMS CORP (AVAI-N)
Inventor: BLICKENSTAFF R L; BRANT C I; DODD P D; KIRCHNER A H; MONTEZ J K; TREDE B E; WINTER R A; BRANT C
Number of Countries: 020 Number of Patents: 009
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9523376	A1	19950831	WO 95US1660	A	19950210	199540	B
AU 9519142	A	19950911	AU 9519142	A	19950210	199550	
US 5537585	A	19960716	US 94201658	A	19940225	199634	
EP 746819	A1	19961211	EP 95911653	A	19950210	199703	
			WO 95US1660	A	19950210		
JP 9510806	W	19971028	JP 95522361	A	19950210	199802	
			WO 95US1660	A	19950210		
AU 693868	B	19980709	AU 9519142	A	19950210	199838	
US 5832522	A	19981103	US 94201658	A	19940225	199851	
			US 96650114	A	19960522		
EP 746819	B1	19991215	EP 95911653	A	19950210	200003	
			WO 95US1660	A	19950210		
DE 69513956	E	20000120	DE 613956	A	19950210	200011	
			EP 95911653	A	19950210		
			WO 95US1660	A	19950210		

Priority Applications (No Type Date): US 94201658 A 19940225; US 96650114 A 19960522
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9523376	A1	E	53	G06F-012/08	
Designated States (National): AU CA JP					
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE					
EP 746819	B1	E		G06F-012/08	Based on patent WO 9523376
Designated States (Regional): DE FR GB IT					
DE 69513956	E			G06F-012/08	Based on patent EP 746819
					Based on patent WO 9523376
AU 9519142	A			G06F-012/08	Based on patent WO 9523376
US 5537585	A		24	G06F-017/30	
EP 746819	A1	E	53	G06F-012/08	Based on patent WO 9523376
Designated States (Regional): DE FR GB IT					
JP 9510806	W		58	G06F-012/00	Based on patent WO 9523376
AU 693868	B			G06F-012/08	Previous Publ. patent AU 9519142

US 5832522 A G06F-017/30

Based on patent WO 9523376
Div ex application US 94201658
Div ex patent US 5537585

Data storage management for network interconnected processors...

...**has file servers to store data files with secondary storage for files migrated from servers and storage server to manage data file transfer**

...Abstract (Basic): The system is connected to a local area network (1) and includes a **storage** server (50) that, on a demand basis and/or on a periodically scheduled basis, audits the activity on each **volume** of each data **storage** device (31-33) that is connected to the network. Low priority data files are migrated via the network and the **storage** server to backend data **storage** media (61-65), and the directory resident in the data **storage** device is updated with a placeholder entry to indicate that this data file has been migrated to backend **storage**. When the processor (21-22) **requests** this data file, the placeholder entry enables the **storage** server to recall the **requested** data file to the data **storage** device from which it originated...

...at least one volume on one of the file servers as directly accessible additional data **storage space** for the use of the processor to **store** data files...

...ADVANTAGE - Has **hierarchical** data **storage** to migrate lower **priority** data files to backend less expensive media. Provides automated disaster recovery data **backup** and data **space** management...

...Abstract (Equivalent): A data **storage** management system for a data network which functions to interconnect a plurality of file servers...

...**secondary storage** means for storing data files migrated from said file servers...

...**storage** server means connected to said network for automatically **managing** transfer of data files, independent of said file servers, between said plurality of file servers and said **secondary storage** means...

...means for collecting a plurality of data files, that are transmitted to said **secondary storage** means, into a transfer unit

...Title Terms: **STORAGE;**

International Patent Class (Main): **G06F-012/00...**

...**G06F-012/08...**

...**G06F-017/30**
International Patent Class (Additional): **G06F-003/06**...

...**G06F-013/00**
Manual Codes (EPI/S-X): **T01-C01**...
...**T01-H03A**

39/3,K/31 (Item 31 from file: 350) **Links**
Derwent WPIX

008353981 **Image available**
WPI Acc No: 1990-240982/199032
XRPX Acc No: N90-186997

Implicit management of computer data storage allocation - through definition of classes of data and groups of storage matched to applicator program's needs

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC); IBM CORP (IBMC)
Inventor: GELB J P; TYRRELL J C; TYRELL J C
Number of Countries: 004 Number of Patents: 005
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 381651	A	19900808	EP 90850034	A	19900125	199032	B
US 5018060	A	19910521	US 89301970	A	19890126	199123	
EP 381651	A3	19921021	EP 90850034	A	19900125	199341	
EP 381651	B1	19961127	EP 90850034	A	19900125	199701	
DE 69029210	E	19970109	DE 629210	A	19900125	199707	
			EP 90850034	A	19900125		

Priority Applications (No Type Date): US 89301970 A 19890126
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 381651	B1	E	28	G06F-017/30	
Designated States (Regional): DE FR GB					
DE 69029210	E			G06F-017/30	Based on patent EP 381651

Implicit management of computer data storage allocation...

...through definition of classes of data and groups of storage matched to applicator program's needs

...Abstract (Basic): A computer data **storage** uses units of data (data sets, data bases etc.) to allocate **storage space** in the **storage** system based on implicit analysis of the unit of data. ''Classes'' are defined for the units of data, **storage** characteristics, and life cycle management needs. ''**Storage** groups '' are also defined in relation to **storage** performance and management independent of individual devices...

...A **storage** allocation **request** has its parameters matched with those of the class and group **storage** definitions...

...USE/ADVANTAGE - Frees application programmer from involvement in detailed selection of **storage** system to be utilised. (24pp Dwg.No.2/8)
...Abstract (Equivalent): A machine-effected method for enabling the

managing of data **storage** for data storable in a data **storage** system and for enabling later management of such data stored in said data **storage** system, the method comprising the machine-executed steps of: establishing and storing (16) in said data **storage** system a plurality of **storage** class definitions, each of said definitions including predetermined data **storage** performance and availability parameters; establishing and storing (17) in said data **storage** system a plurality of management class definitions, each management class definition including management parameters such as life cycle processing for handling units of data stored in the data **storage** system, these management parameters being independent of said performance and availability parameters; establishing and storing (18) in said data **storage** system **storage** group definitions each of which **list** a plurality of data **storing volumes** including operations to be performed on data **stored** in **volumes** which are in the respective **storage** groups; and establishing and storing in said data **storage** system a plurality of automatic class selection routines for respectively selecting (142, 144, 145) a one of said **storage** and management classes and one of the **storage** groups for each separately addressable unit of data to be stored in the data **storage** system wherein each of the automatic class selection routines access the respective definitions stored in the data **storage** system during each said class selection...

...Abstract (Equivalent): Units of data (data sets, data bases, etc.) are allocated data **storage space** in a data **storage** system based on implicit analysis of the unit of data. A plurality of data classes, each defining predetermined characteristics of diverse units of data, are established for the data **storage** system. A set of **storage** classes, each defining predetermined sets of **storage** performance and availability requirements are established for the data **storage** system. A set of management classes, each defining respective diverse sets of life cycle attributes for units of data are established for the data **storage** system. A set of **storage** groups, each defining diverse predetermined performance device and management available in the data **storage** system but independently of the individual **storage** devices of the data **storage** system are established. The devices are selectively assigned to **different** ones of the established **storage** groups...

...spaced allocation requested has its parameters (source, type of data, etc) matched with the data, **storage** and management classes for assignment of one each of those classes to the unit of data related to the allocation **request**. A **storage** group is also assigned. TThe matching of the **different** classes and group are independent of one **another**. Allocation is based upon the resulting class and group selection.

...Title Terms: **STORAGE**;

International Patent Class (Main): **G06F-017/30**

International Patent Class (Additional): **G06F-009/44**...

...**G06F-012/00**...

...**G06F-013/00**...

...**G06F-015/40**
Manual Codes (EPI/S-X): **T01-F05**...

...**T01-J05B**

39/3,K/29 (Item 29 from file: 350) **Links**
Derwent WPIX

008577984 **Image available**
WPI Acc No: 1991-082016/**199112**
XRPX Acc No: N91-063363

Managing collection and storage of data - by storing collected data in temporary file which when full is renamed to another file and oldest of set of files is deleted

Patent Assignee: MITSUBISHI DENKI KK (MITQ)
Inventor: ITO T
Number of Countries: 004 Number of Patents: 005
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 417767	A	19910320	EP 90117584	A	19900912	199112	B
EP 417767	A3	19930203	EP 90117584	A	19900912	199347	
US 5398337	A	19950314	US 90581618	A	19900912	199516	
			US 9380061	A	19930623		
EP 417767	B1	19951129	EP 90117584	A	19900912	199601	
DE 69023849	E	19960111	DE 623849	A	19900912	199607	
			EP 90117584	A	19900912		

Priority Applications (No Type Date): JP 89236042 A 19890912
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 417767	A				
Designated States (Regional): DE GB SE					
US 5398337	A		11	G06F-015/40	Cont of application US 90581618
EP 417767	B1	E	12	G06F-005/06	
Designated States (Regional): DE GB SE					
DE 69023849	E			G06F-005/06	Based on patent EP 417767

Managing collection and storage of data...

...by storing collected data in temporary file which when full is renamed to another file and oldest of set of files is deleted

...Abstract (Basic): controller (PC) (1) used to collect data from the monitored plant, data is transferred to **monitoring** equipment (8) which stores the data on **auxiliary storage** (14). The **auxiliary storage** contains a predefined number of work files. Data is transferred into a temporary file and...

....the temporary file. The stored data from all but the temporary file may also be **extracted** to form a combined file...

...Abstract (Equivalent): A method of collecting and storing data, comprising the provision of a **storage** means (14) with a **storage capacity** corresponding to a predetermined number

N of data **storage** files and characterised in that a series of data files (42) is created by **first** storing collected data in a temporary file (40) when data collection is carried out followed by changing the temporary file (40) into one (n) of said **storage** files (42) by a renaming process; and in that said series of data files (42...

...order from the oldest file each time data collection is carried out once said data **storage** files (42) have reached said predetermined number N...

...Abstract (Equivalent): The method of collecting and storing data involves providing a **monitoring** unit including a CPU and an electromagnetic **storage** unit. A controller collects data, at predetermined intervals, to be sent to and stored in the **storage** unit. The CPU creates a series of data **storage** files in the **storage** unit by repeating the process of **first** designating a temporary **storage** file for an **initial** **storage** of collected data, storing, individually, the collected data at predetermined intervals in the temporary file during data collection, and subsequently renaming the temporary file as one of the data **storage** files. The data **storage** files are available for access while the collected data is being stored in the temporary...

...The CPU indefinitely over-writes the series of data **storage** files, after the number of the files created is equal to a predetermined number by deleting data **stored** in the data **storage** files in **order**, one data **storage** file at a time, starting with an oldest file stored. The data **storage** file from which data has been deleted is redesignated as the temporary file ...

...USE/ADVANTAGE - Collects data without concerning about remaining **storage capacity**. **Stores** data whilst compilation file is being made up...

...Title Terms: **STORAGE**;

International Patent Class (Main): **G06F-005/06**...

...**G06F-015/40**

39/3,K/55 (Item 55 from file: 347) **Links**
JAPIO

03719115 **Image available**

DATA DUAL WRITING METHOD FOR DISK CONTROLLER

Pub. No.: 04-084215 [JP 4084215 A]
Published: March 17, 1992 (**19920317**)
Inventor: MURATA TOMOHIRO
AKATSU MASAHARU
KURIHARA KENZO
HONMA SHIGEO
Applicant: HITACHI LTD [000510] (A Japanese Company or Corporation), JP (Japan)
Application No.: 02-198166 [JP 90198166]
Filed: July 26, 1990 (19900726)
Journal: Section: P, Section No. 1380, Vol. 16, No. 305, Pg. 164, July 06, 1992 (19920706) ...
Published: 19920317)
International Class: G06F-003/06; G06F-012/08

ABSTRACT

PURPOSE: To allow both driving **storage** data to be coincident with each other at high **speed** at the **time** of releasing both drives while improving dual **writing** processing performance by providing the upper **limit** value of the number of tracks, which can be stored on a disk cache and controlling writing by means of the **original** and **auxiliary** drives... ...CONSTITUTION: The upper **limit** of the number of the **copy** tracks on a cache memory 106 is set in the number of the **tracks** which can be written into the **auxiliary** disk drive 120 within restricted **interval** of **time**. When the number of the **copy** tracks is within the upper **limit** value, the **copy** tracks are **stored** in the drive 120 in a synchronizing with the completion of writing into the **original** disk drive 110. When the number exceeds the upper **limit**, the unwritten **copy** tracks of the drive 120 of the memory 106 for the number less than the upper limit value and more than an arbitrary lower **limit** value are **stored** in the drive 120 in synechronizing with the writing into the drive 110. Thus, the... ...the cache to both drives is appriately controlled and dual writing is made efficient. Then, **original** and **auxiliary** driving **storage** data at the **time** of releasing dual writing can be **speedily** made coincident with each other.

DATA DUAL WRITING METHOD FOR DISK CONTROLLER

Patent number: JP4084215

Publication date: 1992-03-17

Inventor: MURATA TOMOHIRO; AKATSU MASAHARU; KURIHARA KENZO; HONMA SHIGEO

Applicant: HITACHI LTD

Classification:

- international: ***G06F3/06; G06F12/08;*** **G06F3/06; G06F12/08;** (IPC1-7): G06F3/06; G06F12/08

- european:

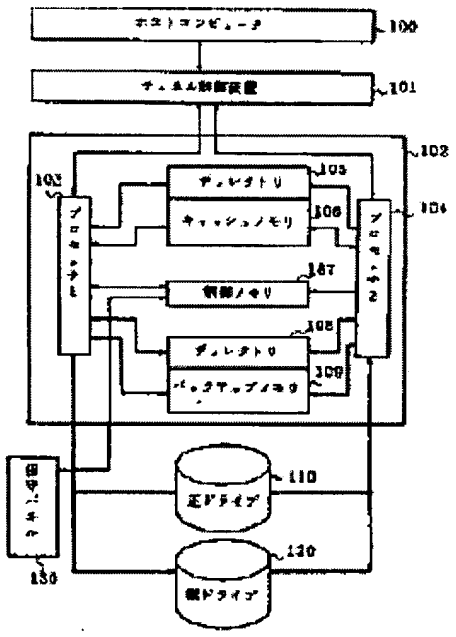
Application number: JP19900198166 19900726

Priority number(s): JP19900198166 19900726

Abstract of **JP4084215**

PURPOSE:To allow both driving storage data to be coincident with each other at high speed at the time of releasing both drives while improving dual writing processing performance by providing the upper limit value of the number of tracks, which can be stored on a disk cache and controlling writing by means of the original and auxiliary drives.

CONSTITUTION:The upper limit of the number of the copy tracks on a cache memory 106 is set in the number of the tracks which can be written into the auxiliary disk drive 120 within restricted interval of time. When the number of the copy tracks is within the upper limit value, the copy tracks are stored in the drive 120 in a synchronizing with the completion of writing into the original disk drive 110. When the number exceeds the upper limit, the unwritten copy tracks of the drive 120 of the memory 106 for the number less than the upper limit value and more than an arbitrary lower limit value are stored in the drive 120 in synechronizing with the writing into the drive 110. Thus, the number of the copy tracks on the cache to both drives is appriately controlled and dual writing is made efficient. Then, original and auxiliary driving storage data at the time of releasing dual writing can be speedily made coincident with each other.



39/3,K/10 (Item 10 from file: 350) **Links**
Derwent WPIX

012367529 **Image available**
WPI Acc No: 1999-173636/**199915**
XRPX Acc No: N99-127655
Cell multiplexing priority controller for slave apparatus connected to master system - provides cell multiplexing priority to specific buffer in which storage amount of cells exceeds threshold value, based on remnant cell storage capacity monitoring result
Patent Assignee: MITSUBISHI ELECTRIC CORP (MITQ)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 11027284	A	19990129	JP 97179429	A	19970704	199915	B

Priority Applications (No Type Date): JP 97179429 A 19970704
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 11027284	A		10	H04L-012/28	

Cell multiplexing priority controller for slave apparatus connected to master system...

...**provides cell multiplexing priority to specific buffer in which storage amount of cells exceeds threshold value, based on remnant cell storage capacity monitoring result**

...Abstract (Basic): NOVELTY - Monitoring modules (116a,116b,116n) **monitors** the remnant cell **storage capacity** of each buffer in **slave** apparatus and outputs a corresponding signal. Based on the monitoring result, the cell multiplexing priority is given to the specific buffer in which **storage** amount of input cell exceeds the **threshold** value...

...USE - For several **slave** apparatus connected to **master** system...
...Title Terms: **SLAVE;**

PREFERENTIAL MULTIPLEXER OF CELL

Patent number: JP11027284
Publication date: 1999-01-29

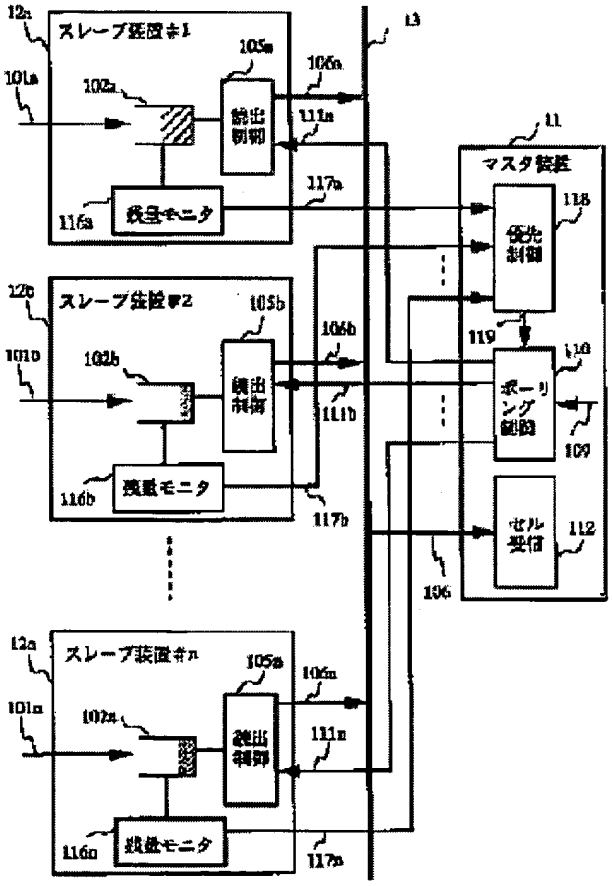
Inventor: MAKINO SHINYA; AKITA MASASHI; KITAYAMA TADAYOSHI
Applicant: MITSUBISHI ELECTRIC CORP

Classification:
- international: ***H04L12/28; H04Q3/00;*** **H04L12/28; H04Q3/00;** (IPC1-7): H04L12/28; H04Q3/00
- european:
Application number: JP19970179429 19970704
Priority number(s): JP19970179429 19970704

Report a data error here

Abstract of **JP11027284**

PROBLEM TO BE SOLVED: To reduce delay due to multiplex for a cell in which no possibility of the cell discard and the delay in a slave device is allowed by preferentially controlling the multiplex for the slave device based on a signal from a residual amount monitor. SOLUTION: The number of residual cells in a buffer 102 is monitored by a residual amount monitoring circuit 116 and the number of the residual cells in the buffer is informed to a master device 11 in the slave device 12. A monitor circuit output signal 117 is received in the master device 11, one of the slave devices 12 to execute polling, for example, 12i is determined and a preferential control result 119 is transmitted to a polling control circuit 110 in a preferential control circuit 118. An individual polling signal 111i is outputted for line slave 12i corresponding to the control result 119 in the polling control circuit 110, the cell in a buffer 102i is read by a reading control circuit 105i, cell flow 106i is transmitted to the master device 11 and the cell flow is received by a cell reception circuit 112 in the slave device 12i.



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Set     Items   Description
S1    1016159   S STORAG? OR (STORE? OR STORING?)(2N)(GROUP? OR SYSTEM? OR COMPUTER? OR
SERVER? OR DATABASE? OR ARRAY?)
S2    9955107   S FIRST? OR 1ST OR PRIMARY OR INITIAL? OR ORIGINAL? OR LEADOFF? OR MAIN OR
CHIEF OR INTRODUCTORY? OR MASTER? OR MANAGER? OR MANAGING?
S3   14938941   S SECOND? OR 2ND OR DOUBL? OR TWIN? OR EXTRA? OR ANOTHER OR SUBSIDIAR? OR
AUXILIAR? OR DIFFERENT? OR ALTERNAT? OR SLAVE?
S4    1441995   S DUPLICAT? OR SUBSIDIAR? OR PARALLEL? OR FAILSAFE? OR FAIL()SAFE? OR
SHADOW?
S5    2819374   S RESERVE? OR SUPPLEMENTAL? OR SUPPLEMENTARY? OR EMERGENCY? OR SUBSTITUT?
OR SURROGAT?
S6      89634   S S1 AND S2 AND S3:S5
S7       6604   S CHECK? OR REQUEST? OR QUER? OR INTERROGAT? OR AUDIT? OR INQUIR? OR PING?
OR TRACK?
S8      10341   S SURVEY? OR SURVEILL? OR ASCERTAIN? OR ASSESS? OR MONITOR? OR QUIZ?
S9      89634   S STORE? OR STORING? OR STORAG? OR WRITE? OR WRITING? OR COPY? OR
TRANSFER? OR RECORD?
S10      3266   S BACKUP? OR BACK?()UP OR UPDAT? OR COPIE? OR DUPLICAT?
S11      3719   S DATA(2N)TRANSMI? OR REPLICAT? OR SYNCHRON? OR ASYNCHRON?
S12     27709   S CAPACITY? OR VOLUME? OR ROOM? OR THRESHOLD? OR SPACE? OR LIMIT?
S13     25836   S TIME OR TEMPORAL? OR CLOCK OR CLOCKTIME? OR CLOCKSPEED? OR CLOCKRATE?
S14     13952   S DURATION? OR SPAN? ? OR GAP? ? OR LACUNA? OR EXTENT? OR PERIOD? ? OR
INTERVAL? OR THRESHOLD?
S15      8254   S SPEED? OR PACE? ? OR TEMPO? OR SESSION?
S16     19320   S ORDER? OR SEQUENC? OR HIERARCH? OR PRIORIT? OR QUEUE? OR PECKING()ORDER?
S17      2355   S STACK? OR LIST? ? OR TAXONOM?
S18      2643   S S6 AND S3:S5(7N)S1 AND S1:S5 AND S7:S8
S19       321   S S18 AND S9:S11(7N)S12
S20       138   S S18 AND S13(7N)S14:S15
S21       175   S S18 AND S9:S11(7N)S16:S17
S22         0   S S19 AND S20 AND S21
S23        49   S S19 AND S20:S21
S24        29   S S20 AND (S19 OR S21)
S25        52   S S21 AND S19:S20
S26        65   S S23:S25
S27        54   S S26 AND PY<2004
S28        54   S S26 NOT PY>2003
S29        45   S S19:S21 AND S2(5N)S1 AND S3:S5(5N)S1 AND (S3:S5 OR S1)(5N)S7:S8 AND
S9:S17
S30        38   S S29 AND PY<2004
S31        38   S S29 NOT PY>2003
S32        81   S S27:S28 OR S30:S31
S33        60   RD  (unique items)
 ; show files
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[File 2] **INSPEC** 1898-2006/Apr W1

[File 6] **NTIS** 1964-2006/Mar W4

[File 8] **Ei Compendex(R)** 1970-2006/Apr W1

[File 34] **SciSearch(R) Cited Ref Sci** 1990-2006/Apr W1

NON PAT LIT BIBLIOG FILES

vlex.com

[File 35] **Dissertation Abs Online** 1861-2006/Mar

[File 56] **Computer and Information Systems Abstracts** 1966-2006/Mar

[File 60] **ANTE: Abstracts in New Tech & Engineer** 1966-2006/Mar

[File 65] **Inside Conferences** 1993-2006/Apr 11

[File 94] **JICST-EPlus** 1985-2006/Jan W3

[File 99] **Wilson Appl. Sci & Tech Abs** 1983-2006/Mar

[File 111] **TGG Natl.Newspaper Index(SM)** 1979-2006/Apr 03

[File 144] **Pascal** 1973-2006/Mar W3

[File 239] **Mathsci** 1940-2006/May

[File 256] **TecInfoSource** 82-2006/May

33/3,K/5 (Item 5 from file: 2) **Links**

Fulltext available through: USPTO Full Text Retrieval Options

07101582 **INSPEC Abstract Number:** C9901-6120-027

Title: Integrated document caching and prefetching in storage hierarchies based on Markov-chain predictions

Author Kraiss, A.; Weikum, G.
Author Affiliation: Dept. of Comput. Sci., Saarlandes Univ., Saarbrucken, Germany

Journal: VLDB Journal vol.7, no.3 p. 141-62
Publisher: Springer-Verlag ,
Publication Date: Aug. 1998 **Country of Publication:** Germany
CODEN: VLDBFR **ISSN:** 1066-8888
SICI: 1066-8888(199808)7:3L.141:IDCP;1-U
Material Identity Number: O851-98003
U.S. Copyright Clearance Center Code: 1066-8888/98/$2.00+0.20
Language: English
Subfile: C

Title: Integrated document caching and prefetching in storage hierarchies based on Markov-chain predictions

Abstract: Large multimedia document archives may hold a major fraction of their data in tertiary storage libraries for cost reasons. This paper develops an integrated approach to the vertical data migration between the tertiary, secondary, and primary storage in that it reconciles speculative prefetching, to mask the high latency of the tertiary storage, with the replacement policy of the document caches at the secondary and primary storage level, and also considers the interaction of these policies with the tertiary and secondary storage request scheduling. The integrated migration policy is based on a continuous-time Markov chain model for predicting the expected number of accesses to a document within a specified time horizon. Prefetching is initiated only if that expectation is higher than those of the documents that need to be dropped from secondary storage to free up the necessary space. In addition, the possible resource contention at the tertiary and secondary storage is taken into account by dynamically assessing the response time benefit of prefetching a document versus the penalty that it would incur on the response time of the pending document requests. The parameters of the continuous- time Markov chain model, the probabilities of co-accessing certain documents and the interaction times between...

Descriptors: cache storage;
Identifiers: ...storage hierarchies; ... ...tertiary storage; ... ...secondary storage; ... ...primary storage; ... ...response time; ... ...continuous-time Markov chain model
1998

33/3,K/49 (Item 3 from file: 35) **Links**
Dissertation Abs Online

01571393 ORDER NO: AAD97-25874

QUERY OPTIMIZATION IN TERTIARY STORAGE BASED SYSTEMS USING A GENERALIZED STORAGE MODEL (HIERARCHICAL STORAGE MANAGEMENT, DATABASE)

Author: TIKEKAR, RAHUL VASANT
Degree: PH.D.
Year: 1997
Corporate Source/Institution: WAYNE STATE UNIVERSITY (0254)
Source: Volume 5803B of Dissertations Abstracts International.
PAGE 1378 . 136 PAGES

QUERY OPTIMIZATION IN TERTIARY STORAGE BASED SYSTEMS USING A GENERALIZED STORAGE MODEL (HIERARCHICAL STORAGE MANAGEMENT, DATABASE)
Year: 1997

With the growing demand for storage space from storage hungry database applications, designers will have to look at a hierarchical storage based systems. Such a system will consist of primary, secondary and tertiary storage devices. Currently tertiary storage is regarded as being external to the system. In this work we look at the situation where tertiary storage is part of an information system thus creating a data warehouse system where applications are no longer constrained by storage limitations.

In this work we are interested in modeling a complex storage system and the placement of data on it. Then we use the model to estimate the I/O related cost of the joint operation, in a hierarchical storage system environment. We propose a model for a generic storage system. The model can be used in a variety of ways: as a measuring tool... ...to better serve those needs.

In this work, the model is used to create a hierarchical storage system and measure the cost of several joint algorithms. We consider the nested loop and... ...O cost. Finally, we look at methods to place fragments of a relation on the storage system such that the I/O time given a joint algorithm is under the specified acceptable time. We propose three placement algorithms aimed at reducing I/O cost. We also study the problem of placing one relation with respect to another.

We feel that the database and data warehouse community will benefit from this work in... ...manner. The proposed model will provide designers the tool to design, analyze and implement an hierarchical storage system. one that integrates tertiary memory systems and conventional information systems to produce a data...

33/3,K/48 (Item 2 from file: 35) Links
Dissertation Abs Online

01599011 ORDER NO: AAD98-01027
ISSUES IN DESIGNING A DISTRIBUTED HIERARCHICAL STORAGE SYSTEM FOR CONTINUOUS MEDIA SERVICE (MULTIMEDIA, STORAGE HIERARCHY)

Author: WON, YOUJIP
Degree: PH.D.
Year: 1997
Corporate Source/Institution: UNIVERSITY OF MINNESOTA (0130)
Source: Volume 5807B of Dissertations Abstracts International.
PAGE 3753 . 183 PAGES
ISSUES IN DESIGNING A DISTRIBUTED HIERARCHICAL STORAGE SYSTEM FOR CONTINUOUS MEDIA SERVICE (MULTIMEDIA, STORAGE HIERARCHY)
Year: 1997

...continuous media services, especially in the commercial entertainment market. In this dissertation, we propose distributed hierarchical storage architecture as a promising solution to cost-effective service provisioning. The advantage of adopting a hierarchical storage architecture is its ability to assign the appropriate storage hierarchy to each file based on its the access frequency. However, success in using a storage hierarchy relies upon selecting appropriate operational parameters with a given user access profile. Our hierarchical storage system consists of primary storage, secondary storage, and tertiary storage. This dissertation analyzes the performance of the hierarchical storage system under various combinations of system attributes and develops a technique to find the minimum amount of resources in each level of hierarchies while satisfying certain operational constraints. The second part of the dissertation focuses on distributed service provisioning. Techniques are developed to exploit the geographical locality of reference and temporal locality of reference by introducing intermediate storages. Due to non-trivial network resource requirements, it is beneficial to put the data closer to the end user. To precisely compute the trade-offs between network resource consumption and storage resource cost, we develop a cost model which quantifies the aggregate resource consumption. On the... ...the cost model, an algorithm which finds the efficient way of servicing a set of requests is developed. The observations and findings from the mathematical models are validated with the simulation...

33/3,K/11 (Item 11 from file: 2) **Links**
Fulltext available through: USPTO Full Text Retrieval Options
INSPEC

06406846 **INSPEC Abstract Number:** C9612-6120-005
Title: Efficient buffering for concurrent disk and tape I/O
Author Myllymaki, J.; Livny, M.
Author Affiliation: Dept. of Comput. Sci., Wisconsin Univ., Madison, WI, USA
Journal: Performance Evaluation **Conference Title:** Perform. Eval. (Netherlands) vol.27-28 p. 453-71
Publisher: Elsevier ,
Publication Date: Oct. 1996 **Country of Publication:** Netherlands
CODEN: PEEVD9 **ISSN:** 0166-5316
SICI: 0166-5316(199610)27/28L.453:EBCD;1-E
Material Identity Number: A894-96011
U.S. Copyright Clearance Center Code: 0166-5316/96/$15.00
Conference Title: Performance '96: 18th International Symposium on `Information Processing System Modeling, Measurement and Evaluation
Conference Date: 7-12 Oct. 1996 **Conference Location:** Lausanne, Switzerland
Language: English
Subfile: C

Abstract: Tertiary **storage** is becoming increasingly important for many organizations involved in large scale data analysis and data... ...activities. Yet database management systems (DBMS) and other data intensive systems do not incorporate tertiary **storage** as a **first** class citizen in the **storage hierarchy**. For instance, the typical solution for bringing tertiary resident data under the control of a DBMS is to use operating system facilities to **copy** the data to **secondary storage**, and then to perform **query** optimization and execution as if the data bad been in **secondary storage** all along. This approach fails to recognize the opportunities for saving execution **time** and **storage space** if the data were accessed on tertiary devices directly and in **parallel** with other I/Os. We examine issues in accessing **secondary** and tertiary **storage** in **parallel** and suggest buffering mechanisms for increasing the throughput of applications with concurrent, intensive I/O requirements. We **first** identify several factors that determine the **parallel** I/O performance of **secondary** and tertiary **storage** devices. We discuss the performance characteristics of magnetic disks and magnetic tapes when used alone and when used concurrently, sharing the same I/O bus. We then describe **alternative** buffering schemes for **parallel** I/O and analyze their efficiency via an experimental implementation.
Descriptors: buffer **storage**; ... ...magnetic disc **storage**; ... ...magnetic tape **storage**; ... ...**storage** management
Identifiers: ...tertiary **storage**; ... ...**first** class citizen... ...**storage hierarchy**; ... ...**query** optimization... ...**secondary storage**; ... ...**storage space**; ... ...**parallel** I/O performance
1996

33/3,K/36 (Item 3 from file: 8) **Links**

Fulltext available through: USPTO Full Text Retrieval Options

04844796 **E.I. No:** EIP97103863323

Title: Trace-driven simulation of document caching strategies for Internet web services

Author: Arlitt, Martin F.; Williamson, Carey L.
Corporate Source: Univ of Saskatchewan, Saskatoon, Sask, Can

Source: Simulation v 68 n 1 Jan 1997. p 23-33
Publication Year: 1997
CODEN: SIMUA2 **ISSN:** 0037-5497
Language: English

Abstract: ...used to reduce the time that it takes a Web server to respond to client **requests**, by storing the most popular files in the **main** memory of the Web server, and by reducing the **volume** of data that must be **transferred** between **secondary storage** and the Web server. In this paper, we use trace-driven simulation to evaluate the ... ...server. The workload traces for the simulations come from Web server access logs, from six **different** Internet Web servers. The traces represent three **different** orders of magnitude in server activity and two **different** orders of magnitude in **time duration**. The results from our simulation study show that frequency-based caching strategies, using a variation...

33/3,K/10 (Item 10 from file: 2) **Links**

Fulltext available through: USPTO Full Text Retrieval Options

INSPEC

06576401 **INSPEC Abstract Number:** C9706-6120-023

Title: Trace-driven simulation of document caching strategies for Internet Web servers

Author Arlitt, M.F.; Williamson, C.L.

Author Affiliation: Dept. of Comput. Sci., Univ. of Saskatchewan, Sask., Canada

Journal: Simulation vol.68, no.1 p. 23-33

Publisher: Simulation Councils ,

Publication Date: Jan. 1997 **Country of Publication:** USA

CODEN: SIMUA2 **ISSN:** 0037-5497

SICI: 0037-5497(199701)68:1L.23:TDSD;1-F

Material Identity Number: S024-97006

U.S. Copyright Clearance Center Code: 0037-5497/97/$3.00+.10

Language: English

Subfile: C

Abstract: ...used to reduce the time that it takes a Web server to respond to client **requests**, by storing the most popular files in the **main** memory of the Web server, and by reducing the **volume** of data that must be **transferred** between **secondary storage** and the Web server. In this paper, we use trace-driven simulation to evaluate the ... ...server. The workload traces for the simulations come from Web server access logs, from six **different** Internet Web servers. The traces represent three **different** orders of magnitude in server activity and two **different** orders of magnitude in **time duration**. The results from our simulation study show that frequency-based caching strategies, using a variation...

Descriptors: cache **storage**;

Identifiers: ...client **requests**; ... ...**secondary storage**; ... ...**time duration**;

1997

33/3,K/9 (Item 9 from file: 2) **Links**
INSPEC

06698145 **INSPEC Abstract Number:** C9710-6130M-030
Title: Replication of multimedia data using master-slave architecture
Author Sheikh, S.; Ganesan, R.
Author Affiliation: Widener Univ., Chester, PA, USA
Conference Title: Proceedings Twenty-First Annual International Computer Software and Applications Conference (COMPSAC'97) (Cat. No.97CB36112) p. 66-70
Publisher: IEEE Comput. Soc , Los Alamitos, CA, USA
Publication Date: 1997 **Country of Publication:** USA xxi+688 pp.
ISBN: 0 8186 8105 5 **Material Identity Number:** XX97-02215
U.S. Copyright Clearance Center Code: 0730 3157/97/$10.00
Conference Title: Proceedings Twenty-First Annual International Computer Software and Applications Conference (COMPSAC'97)
Conference Sponsor: IEEE Comput. Soc
Conference Date: 13-15 Aug. 1997 **Conference Location:** Washington, DC, USA
Language: English
Subfile: C

Title: Replication of multimedia data using master-slave architecture
Abstract: Multimedia computing requires real-time guaranteed I/O throughput. Today's storage solution doesn't scale to meet the high requirement demand of multimedia. Multimedia data demands a high rate of data transaction and the storage space fills quickly. One direct method is to use the master/slave architecture where a stream of data is broken into smaller pieces and stored temporarily onto different servers. The reliability of data retrieval and consistency in performance depends on the data flow and available bandwidth. Dedicating specific servers to handle a client request and duplicating the data in the background makes not only the system reliable and simple but also ensures that the storage system is evenly filled. By replicating in-coming multimedia stream onto several servers and re-arranging it back to the original order before storing it will solve multi-user access issues. This approach will maintain system reliability and yield a faster response by using more storage units in parallel. The authors present a replication scheme for handling multimedia data that will take advantage of master/slave architecture.
Descriptors: ...storage management... ...storage units
Identifiers: ...master-slave architecture... ...storage space; ... ...client request; ... ...data duplication; ... ...storage system... ...parallel storage units
1997

33/3,K/3 (Item 3 from file: 2) **Links**
Fulltext available through: USPTO Full Text Retrieval Options
INSPEC

07980475 **INSPEC Abstract Number:** C2001-08-6160M-014
Title: Continuous data block placement in and elevation from tertiary storage in hierarchical storage servers
Author Triantafillou, P.; Papadakis, T.
Author Affiliation: Dept. of Comput. Eng., Tech. Univ. of Crete, Chania, Greece
Journal: Cluster Computing vol.4, no.2 p. 157-72
Publisher: Kluwer Academic Publishers ,
Publication Date: 2001 **Country of Publication:** Netherlands
CODEN: CLCOFM **ISSN:** 1386-7857
SICI: 1386-7857(2001)4:2L.157:CDBP;1-8
Material Identity Number: H401-2001-003
Language: English
Subfile: C

Title: Continuous data block placement in and elevation from tertiary storage in hierarchical storage servers
Abstract: Given the cost of memories and the very large storage and bandwidth requirements of large-scale multimedia databases, hierarchical storage servers (which consist of disk-based secondary storage and tape-library-based tertiary storage) are becoming increasingly popular. Such server applications rely upon tape libraries to store all media, exploiting their excellent storage capacity and cost per MB characteristics. They also rely upon disk arrays, exploiting their high bandwidth, to satisfy a very large number of requests. Given typical access patterns and server configurations, the tape drives are fully utilized uploading data for requests that "fall through" to the tertiary level. Such upload operations consume significant secondary storage device and bus bandwidth. In addition, with present technology (and trends) the disk array can serve fewer requests to continuous objects than it can store, mainly due to IO and/or backplane bus bandwidth limitations. In this paper we address comprehensively the performance of these hierarchical, continuous-media, storage servers by looking at all three main system resources: the tape drive bandwidth, the secondary-storage bandwidth, and the host's RAM. We provide techniques which, while fully utilizing the tape drive bandwidth (an expensive resource) they introduce bandwidth savings, which allow the secondary storage devices to serve more requests and do so without increasing demands for the host's RAM space. Specifically, we consider... ...for display purposes. We develop algorithms for sharing the responsibility for the playback between the secondary and tertiary devices and for placing the blocks of continuous objects on tapes, and show how they achieve the above goals. We study these issues for different commercial tape library products with different bandwidth and tape capacity and in environments with and without the multiplexing of tape libraries.
Descriptors: digital storage;
Identifiers: ...tertiary storage; ... ...hierarchical storage servers... ...very large storage; ... ...disk-based secondary storage; ... ...tape-library-based tertiary storage;
2001

33/3,K/1 (Item 1 from file: 2) **Links**
INSPEC

08677898 **INSPEC Abstract Number:** C2003-08-6160Z-022
Title: Hierarchical storage support and management for large-scale multidimensional array database management systems
Author Reiner, B.; Hahn, K.; Hofling, G.; Baumann, P.
Author Affiliation: FORWISS (Bavarian Res. Center for Knowledge Based Syst.), Munich, Germany
Conference Title: Database and Expert Systems Applications. 13th International Conference, DEXA 2002. Proceedings (Lecture Notes in Computer Science Vol.2453) p. 689-700
Editor(s): Hameurlain, A.; Cicchetti, R.; Traunmuller, R.
Publisher: Springer-Verlag , Berlin, Germany
Publication Date: 2002 **Country of Publication:** Germany xviii+951 pp.
ISBN: 3 540 44126 3 **Material Identity Number:** XX-2002-02754
Conference Title: Database and Expert Systems Applications. 13th International Conference, DEXA 2002. Proceedings
Conference Date: 2-6 Sept. 2002 **Conference Location:** Aix-en-Provence, France
Language: English
Subfile: C

Title: Hierarchical storage support and management for large-scale multidimensional array database management systems
Abstract: ...up to petabytes). In the present and the near future, the only practicable way for storing such large volumes of multidimensional data are tertiary storage systems. But commercial (multidimensional) database systems are optimized for performance with primary and secondary memory access. So tertiary storage memory is only in an insufficient way supported for storing or retrieval of multidimensional array data. To combine the advantages of both techniques, storing large amounts of data on tertiary storage media and optimizing data access for retrieval with multidimensional database management systems is the intention of this paper. The paper introduces concepts for efficient hierarchical storage support and management for large-scale multidimensional array database management systems and their integration into...
Descriptors: query processing... ...storage management
Identifiers: hierarchical storage support... ...storage management... ...tertiary storage systems
2002

33/3,K/51 (Item 5 from file: 35) **Links**
Dissertation Abs Online

01504231 ORDER NO: AAD96-29965
PERFORMANCE EVALUATION OF HIERARCHICAL MASS STORAGE SYSTEMS

Author: PENTAKALOS, ODYSSEAS IOANNIS
Degree: PH.D.
Year: 1996
Corporate Source/Institution: UNIVERSITY OF MARYLAND BALTIMORE COUNTY (0434)
Source: Volume 5705B of Dissertations Abstracts International.
PAGE 3291 . 181 PAGES
PERFORMANCE EVALUATION OF HIERARCHICAL MASS STORAGE SYSTEMS
Year: 1996

...land-atmosphere interactions. These enormous amounts of data will impose tremendous demands on the underlying storage systems. To allow for the efficient storage and retrieval of such enormous amounts of data it is necessary to develop high-performance mass storage systems.

Mass storage systems consist of a hierarchy of storage media arranged in such an order as to provide a fast access, high capacity, low cost storage system. The continuous increase in user demands at scientific computing research centers for storage space forces system administrators to procure additional storage devices without access to tools for justifying such procurement. Furthermore, the plethora of available storage devices in the market with different performance characteristics makes this capacity planning process even more difficult.

This dissertation addresses this lack of tools for performance evaluation and capacity planning of hierarchical mass storage systems. Its main contributions are the development of queueing network models for both host attached and network attached device based mass storage systems. Two approximations were developed as components of this work. The first is an approximation of the performance of RAID devices in the setting of mass storage systems with multiple classes of requests. The second is an approximation of the simultaneous resource possession problem which occurs during tape to disk transfers in mass storage systems. The accuracy of both approximations was validated using process-based simulations. The third contribution of this dissertation is the development of Pythia--a tool for performance evaluation of hierarchical mass storage systems. Using the graphical user interface of Pythia, a user can easily describe the architecture of a mass storage system. The tool then automatically generates a queueing network model of the mass storage system and solves it using the modified multi-class approximate Mean Value Analysis algorithm with...